

Alternative Fuel Use in NCDOT Fleet

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by
Drew Harbinson, Director
Equipment and Inventory Control

- What NCDOT is already doing.
- Plans to expand alternative fuel usage.
- Where we see the industry moving.

Alternative Fuel Use in NCDOT Fleet

- **NCDOT is the largest single user of bio-diesel other than Federal fleets, currently consuming 2.2 million gallons per year.** Plans are to expand the use to all 14 divisions by October, 2006.
- **We are currently expanding the use of Ethanol (E-10) to all 14 divisions.** Will complete by month's end.
- **Continuing to use Propane and CNG on a smaller scale.**

Alternative Fuel Use in NCDOT Fleet

- **With the increased cost of gasoline, Ethanol is becoming a more attractive alternative.**
- **NCDOT will gradually begin to add additional fuel tank capacity dedicated to E-85.**
 - GM, Dodge, and now Ford are producing “flex-fuel” pickup trucks, making E-85 a viable alternative fuel for the NCDOT fleet.

Alternative Fuel Use in NCDOT Fleet

- **Plan to target air quality non-attainment areas of the State to expand E-85 tank capacity, first.**
- **Plan to coordinate this with the purchase of “flex fuel” E-85 pickup trucks.** E-85 is more subject to moisture retention. Therefore, there has to be sufficient flex fuel pickups in the area where we place dedicated tanks to insure the fuel is turned over. Optimum turnover time is approximately 3 months, after which we’ve experienced mechanical problems.

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- Barriers to rapid expansion of E-85.
 - To install one dedicated E-85 tank, dispenser, tank monitoring system and Fuelmaster software would cost between \$80,000 to \$100,000 depending on the site.
 - To install sites in all 42 non-attainment counties would cost an estimated \$3,360,000 to \$4,200,000, depending on sites.
 - To purchase flex fuel pickups (30) to support one site would cost an estimated \$480,000.

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- Barriers to rapid expansion of E-85.
 - To purchase flex fuel pickups (1260) to support all 42 non-attainment county E-85 fuel sites would cost an estimated \$20,160,000.
 - Not all of our sites have sufficient room to add a tank and dispenser. We would prefer that additional tanks be co-located at existing sites for logistical reasons.

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- Barriers to rapid expansion of E-85 (cont'd)
 - The supply of E-85 is unstable. In October of this year we are mandated to go to ultra low sulfur diesel fuel. Alcohol is used in the production process of ULSD, and therefore has negatively impacted the supply of alcohol available for Ethanol production. This will eventually level out when supply availability meets demand.

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- Barriers to general public use of NCDOT sites.
 - There are issues involving access to the sites. Some sites are 24 hour and some are not. None currently have a dedicated attendant.
 - There are liability issues for the Department. How we insure against accidents, injuries, vandalism, and theft.
 - The Department and state agencies are fuel tax exempt. The general public is not.

Alternative Fuel Use in NCDOT Fleet

- Barriers to general public use of NCDOT sites (cont'd).
 - NCDOT does not have the authority or the capacity to collect fuels tax revenue.
 - There are capacity issues. We would probably not be able to inventory enough E-85 to handle our fleet, other agencies, and the general public.
 - During emergency conditions we would be forced to restrict access to fuel sites to only NCDOT and some other State agency fleets.

Alternative Fuel Use in NCDOT Fleet

- **We are exploring the move to synthetic oils, lubricants, and greases.** This will allow further time/mileage increases in oil and lubricant change intervals.
- **We are continuing to increase the oil change intervals with the use of by-pass filtration.** Originally, oil was changed every 5,000 miles. We increased that to 20,000 miles and are moving to 40,000 miles. Have actually tested up to 80,000 miles with no failures.

Alternative Fuel Use in NCDOT Fleet

- New fuels/vehicles coming to market.
 - Major manufacturers are focusing a great deal of research on expanding the models of hybrid/electric powered vehicles.
 - The cost of hydrogen powered vehicles will continue to drop as the technology matures and a fueling infrastructure is developed.
 - Variable cylinder use engines that use 6 or 8 cylinders to get to road speeds and then drop to 4 or 6 cylinders will likely increase in number.

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- QUESTIONS?